

CALIBRATION STANDARD REQUIREMENT

FOR A

POWER STANDARD SET

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PROCUREMENT PACKAGE

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POWER STANDARD SET

1. SCOPE

1.1 Scope. This requirement defines the mechanical, electrical, and electronic characteristics for a POWER STANDARD SET. This equipment intended to be used by Navy personnel in shipboard and shorebased laboratories to calibrate RF Wattmeters and other test equipment. For the purposes of this requirement, the POWER STANDARD SET shall be referred to as the PSS.

2. APPLICABLE DOCUMENTS

2.1 Controlling Specifications. MIL-T-28800, "Military Specification, Test Equipment for use with Electrical and Electronic Equipment, General specification for," and all documents referenced therein of the issues in effect on the date of this solicitation shall form a part of this requirement.

3. REQUIREMENTS

3.1 General. The PSS shall conform to the Type II, Class 5, Style E requirements as specified in MIL-T-28800 for Navy shipboard and shorebased equipment as modified below. The use of material restricted for Navy use shall be governed by MIL-T-28800.

3.1.1 Design and Construction. The PSS design and construction shall meet the requirements of MIL-T-28800 for Type II equipment.

3.1.2 Power Requirements. Not applicable.

3.1.3 Dimensions and Weight. The maximum dimension of the PSS, including handles and covers, if any, shall not exceed 8 inches in width, 5 inches in height, 12 inches in depth. The weight of the PSS, including all covers and accessories, shall not exceed 7 pounds.

3.1.4 Lithium Batteries. Per MIL-T-28800, lithium batteries are prohibited without prior authorization. A request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

3.2 Environmental Requirements. The PSS shall meet the environmental requirements for a Type II, Class 5, Style E equipment with the deviations specified below.

3.2.1 Temperature and Humidity. The PSS shall meet the conditions below:

	<u>Temperature(°C)</u>	<u>Relative Humidity (%)</u>
Operating	10 to 30	95
	30 to 40	75
Non-operating	-40 to 70	Not Controlled

3.2.2 Electromagnetic Compatibility. The electromagnetic compatibility requirements of MIL-T-28800 are limited to the following areas: CE01, CE02, CS01, CS02 (0.05 to 100 MHz), CS06, RE01 (back panel search excluded), RE02 (14 kHz to 1 GHz), and RS03.

3.3 Reliability. Type II reliability requirements are as specified in MIL-T-28800.

3.3.1 Calibration Interval. The PSS shall have an 85% or greater probability of remaining within tolerances of all specifications at the end of a 12 month period.

3.4 Maintainability. The PSS shall meet the Type II maintainability requirements as specified in MIL-T-28800 except the lowest discrete component shall be defined as a replaceable assembly. Certification time shall not exceed 60 minutes.

3.5 Performance Requirements. The PSS shall provide the following capability as specified below.

3.5.1 Set of Equipment. The PSS shall consist of the following:

1 each - Directional Coupler (DC): Maury Microwave 4098A-15 or equivalent;

1 each - Thermistor Mount (TM): Hewlett-Packard 478A-H75 or equivalent;

2 each - Adapter GR900 to Type N female (ANF): Maury Microwave 2406C or equivalent;

2 each - Adapter GR900 to Type N male (ANM): Maury Microwave 2406D or equivalent;

1 each - Attenuator (ATTN): Weinschel Engineering 2-6 or equivalent;

1 each - Storage/Carrying Case (SCC): Maury Microwave 4098A-85 or equivalent;

2 each - Red Thermofit plastic sleeves with white marking "DO NOT REMOVE." Sleeve is shunk in place over the coupler, adapter and thermistor mount after calibration. Supplied as loose equipment, one spare.

3.5.2 Directional Coupler (DC).

3.5.2.1 Frequency Range. The PSS shall have a directional coupler with a minimum frequency range of 10 MHz to 400 MHz.

3.5.2.2 Coupling. The DC shall have a nominal coupling of 40 dB from the primary line, input port to the secondary output port, with the output port terminated in 50 ohms.

3.5.2.3 Coupling Accuracy. The coupling accuracy of the DC shall not exceed as follows:

Coupling Accuracy (dB)	Frequency (MHz)
0.0 to 2.0	10 to 20
-0.5 to +1.0	20 to 50
-0.8 to +0.8	50 to 250
-1.0 to +0.5	250 to 300
-2.0 to 0.0	300 to 400

3.5.2.4 Directivity. The DC shall have a minimum directivity as follows:

Directivity (dB)	Frequency (MHz)
30	10 to 250
27	250 to 400

3.5.2.5 Impedance. The DC shall have a nominal impedance of 50 ohms at each of the three ports.

3.5.2.6 VSWR. The DC shall have a VSWR no greater than 1.05 at the input and output port and no greater than 1.07 at a coupled port.

3.5.2.7 Power Handling. The DC shall be capable of handling at least 300 Watts CW in the forward or reverse direction.

3.5.2.8 Connectors. The DC shall have precision 14 mm coaxial sexless connectors (GR900 or equivalent) on all three ports.

3.5.3 Thermistor Mount (TM).

3.5.3.1 Frequency Range. The PSS shall have a thermistor mount with a minimum frequency range of 10 MHz to 400 MHz.

3.5.3.2 Power Range. The TM shall have a operating power range of at least 1  $\mu$ W to 10 mW.

3.5.3.3 VSWR. The input VSWR of the TM shall not exceed the following:

VSWR	Frequency(MHz)
1.05	50
1.10	1 to 100
1.20	100 to 400

3.5.3.4 Operating Resistance. The TM shall be capable of operating at a resistance of 200 ohms at its power meter connection when biased by a power meter.

3.5.3.5 Calibration Factor. The TM shall have a calibration factor of at least 88% over its frequency range.

3.5.3.6 Impedance and Connector. The TM shall have a nominal input impedance of 50 ohms and a type N male input connector.

3.5.3.7 Power Meter Connector. The TM shall have a connector to connect to a cable which connects to a power meter. The TM shall have an Amphenol, part number 91-PC6M male panel receptacle or equivalent.

3.5.3.8 Compatibility. The TM shall be fully compatible with the Hewlett-Packard 432A, power meter and its power meter- thermistor mount cable, part number 8120-1083.

3.5.4 Adapters, N, Female (ANF).

3.5.4.1 Frequency Range. The PSS shall have two adapters with a frequency range of DC to 8.5 GHz.

3.5.4.2 VSWR. The VSWR of each ANF shall not exceed  $1.006 + 0.006F$  (GHz) over the frequency range of DC to 400 MHz.

3.5.4.3 Connectors. Each ANF shall have a 14 mm coaxial sexless (GR900 or equivalent) connector on one end and a type N female on the other.

3.5.5 Adapters, N, Male (ANM).

3.5.5.1 Frequency Range. The PSS shall have two adapters with a frequency range of DC to 8.5 GHz.

3.5.5.2 VSWR. The VSWR of each ANM shall not exceed  $1.005 + 0.005F$  (Ghz) over the frequency range of DC to 400 MHz.

3.5.5.3 Connectors. Each ANM shall have a 14 mm coaxial sexless (GR900 or equivalent) connector on one end and a type N male on the other.

### 3.5.6 Attenuator (ATTN).

3.5.6.1 Frequency Range. The PSS shall have an ATTN with a frequency range of DC to 8.5 GHz.

3.5.6.2 Attenuation. The ATTN shall have a nominal attenuation value of 6 dB.

3.5.6.3 Attenuation Tolerance. The tolerance of attenuation shall not exceed  $\pm 0.3$  dB.

3.5.6.4 VSWR. The VSWR of the ATTN shall not exceed 1.15 over the frequency range of DC to 400 MHz.

3.5.6.5 Power Coefficient of Attenuation. The power coefficient of attenuation shall not exceed 0.005 dB per dB per watt.

3.5.6.6 Temperature Coefficient. The temperature coefficient of attenuation shall not exceed 0.0004 dB per dB per degree C.

3.5.6.7 Power Rating. The ATTN shall dissipate 5 watts average power and 1000 watts peak power at 25°C, derating linearly to 0.5 watt at 125°C.

3.5.6.8 Impedance. The ATTN shall have a nominal impedance of 50 ohms.

3.5.7 Storage/Carrying Case (SCC). The PSS shall have a storage/carrying case to hold and protect the directional coupler, thermistor mount, attenuator, and adapters.

3.5.7.1 Access. The SCC shall provide easy access to the DC, TM, ANM, ANF, and ATTN. No tool shall be required to open or close the SCC.

3.5.7.2 Holding. When the SCC is closed, the DC, TM, ANM, ANF, and ATTN shall be confined when the DC is configured with the TM connected to the secondary output port via ATTN so that the components will not shift or come out even if the SCC is inverted.

3.5.7.3 Appearance. The SCC shall be sturdy and of quality appearance.

3.5.7.4 Label. The SCC shall bear a label giving model number and nomenclature of the PSS.

3.6 Operating Requirements. The PSS shall provide the following capabilities.

3.6.1 Front Panel Control requirements. All modes and functions shall be operable using the front panel controls. The locations and labeling of indicators, controls, and switches shall provide for maximum clarity and easily understood operation without reference to tables, charts, or flow diagrams.

3.7 Manual. At least two copies of an operation and maintenance manual shall be provided. The manual shall meet the requirements of MIL-M-7298.

3.7.1 Calibration Procedure. The manual shall provide a PSS calibration procedure in accordance with MIL-M-38793.